

PEDICULOSIS

REPORTING INFORMATION

While pediculosis is not an individually reportable condition in Ohio, outbreaks are required to be reported. In addition, there are specific isolation requirements for individuals with pediculosis.

AGENTS

Pediculus humanus capitis: Head Louse. *Pediculus humanus corporis*: Body Louse. *Pthirus pubis*: Pubic or Crab Louse.

CASE DEFINITION

The current edition of the Centers for Disease Control and Prevention (CDC) "Case Definitions for Infectious Conditions Under Public Health Surveillance" does not list a case definition for national surveillance of pediculosis. See "Signs and Symptoms" and "Diagnosis" below for reporting guidelines in Ohio.

SIGNS AND SYMPTOMS

Head lice infest people of all ages but are especially common on preschool and elementary school aged children, including their household members and caretakers. Head lice are not a sign of poor hygiene and all socioeconomic groups are affected. The adult head louse measures 2-4 mm long and is adapted to life on human hair and the scalp, less commonly lice can also be found on eye brows and eye lashes. Head lice infest the areas around the head and neck and attach eggs (called nits) approximately 4-6 mm from the base of the hair shaft. Lice and nymphs are generally a dull yellow or tan to grayish-white in color, but will appear to be gray or almost black when full of blood. A louse may appear darker in a person with dark hair. The female louse attaches her eggs (nits) to hair shafts close to the scalp with a waterproof, glue-like substance. Nits are frequently pale yellow or white color, but may also become dark if the embryo dies, or will be transparent after the louse emerges. Live nits may also appear to be the same color of the hair of the infested individual. These nits appear as evidence of infestation. Itching (pruritis) is a manifestation of the feeding process and is the primary symptom caused by an allergic reaction to the louse bites. People will often not experience symptoms; therefore itching should not be relied upon as a definitive diagnostic sign. The first time an individual is infested with lice, it may take up to 4 to 6 weeks before possible itching symptoms develop. Other signs and symptoms of an infestation may include the following: a tickling feeling in the hair or a sensation of something moving, sleeplessness or irritability, and/or sores in the head caused by scratching (the sores can become infected with bacteria). A thorough examination of the head will reveal the telltale yellowish to white nits. Head lice do not transmit diseases.

Body lice are generally found only in human populations with extremely poor hygiene living in poor conditions. Body lice hide in the seams of clothing, getting on the infested person's skin to feed only at intervals, generally in areas of the body where clothing is in close proximity to the body, such as the waist, arm pits, thighs, and groin. A small red macular or papular dermatitis with a central punctum or urticarial wheal is the characteristic lesion of body louse infestations. Long-lasting infestations of heavily-bitten areas of the skin, typically on the mid-section, can become thickened and discolored (dark). Fomites have a role in the transmission of body lice. Body lice are unable to survive away from a host (human blood source) longer than 5 to 7 days at room temperature. Elimination of lice and their eggs can be achieved through: 1) removal of lice from the body; 2) thorough cleaning of infested clothing and bedding by laundering in hot water followed by the hot dry cycle of the dryer or by dry cleaning; and 3) thorough bathing of the infested person. Further infestations can be prevented by regular bathing, improved

hygiene, and changing into clean clothing (at least once per week). Clothing, bedding and towels should be laundered regularly. Body lice have been implicated in the transmission of diseases such as trench fever, epidemic (louse-borne) typhus, and relapsing fever.

Under the microscope, **pubic lice** resemble small crabs which live in the ocean; hence, the terms "crab lice" and "crabs" are frequently used to refer to an infestation. All age groups can be infested; however, infestations are more prevalent in sexually active adults. Pruritis (itching) of the anogenital area is a common symptom of pubic lice infestations. Pubic lice are typically found in the pubic region, but can also infest other coarsely haired parts of the body, such as eye lashes, eye brows, facial hair, body hair (e.g. axilla), perianal area, and very rarely on the scalp. (If a louse is found on the head, it is generally head lice, not pubic lice). They are transmitted from one person to another by direct, usually sexual, contact. Although not always present, a characteristic bluish or slate-colored grouping of lesions on the trunk, thighs and upper arms can be common on individuals with a heavy pubic lice infestation. These lesions are called maculae caeruleae or "sky-blue spots." Pubic lice on the head (eyelashes or eyebrows) of a child may be an indication of sexual exposure or abuse, although other modes of transmission are possible. Occasionally, contact with bed linens, towels, or clothing used by infested person may spread pubic lice. Pubic lice are not known to transmit disease; however, individuals that are infested with pubic lice should be examined for other sexually transmitted diseases. Pubic lice and their eggs should be removed manually. All hairy areas of the body should be examined for the presence of lice. The pediculicides used to treat other kinds of louse infestations are effective for treatment of pubic lice (see Treatment). Caution should be used when inspecting, removing or treating lice on or near the eyelashes. Topical pediculicides should not be used for infestations on the eye lashes.

DIAGNOSIS

Definitive diagnosis of lice is made by identifying a louse/lice or nits.

Diagnosis of **head lice** requires a thorough and careful examination of the hair and scalp. Nits are commonly found on the hairs at the nape of the neck and behind the ears where they are protected from extremes of light and temperature, but they can be deposited anywhere on the scalp. The entire head should be examined. Head lice usually deposit their nits 4-6 mm or less from the scalp. (Hair grows at approximately 1 cm per month; therefore the length of the infestation can be estimated by the distance of the nit from the scalp). Live adult and nymphal lice are difficult to find, as they move quickly, avoid light, and hide well. *Lice do not jump or fly.*

The method of examination is not standardized; however, the use of a wooden applicator stick, tongue blade or comb (even the nit combs often supplied with louse control products) will prove helpful to some. Gloves may be worn during examinations. Hand washing immediately after examination is important to prevent transmission of diseases of the scalp, such as ringworm, or transmission of lice to the next person to be examined. Alcohol wipes or swabs are not effective against lice or nits. **Transmission of head lice by the hands of the examiner has never been documented.** Identification of a nit can be facilitated by using a magnifying glass or microscope.

Starting at the scalp, hair should be examined by moving the comb or other device up the hair shaft. Live lice will rarely be found during examinations. Nits are more numerous and are stationary, making them easier to find. It is important to distinguish a nit from dandruff, hair spray globules, irregularities in the hair shaft, or "hair casts." A nit is firmly cemented to the hair shaft and will not be removed easily.

The presence of a live louse or nymph on the scalp of a person is the best method to confirm the existence of a lice infestation. However, because head lice and nymphs are small, move quickly and avoid light, it is often difficult to confirm their presence. An experienced examiner might find only a few adult lice on the scalp. Separating the hair to view the base of the scalp and using a fine toothed comb may facilitate finding a live louse or nymph. The presence of nits close to the scalp (4-6 mm) suggests, but does not confirm a lice infestation.

Refer to "Signs and Symptoms" for diagnosis of body and pubic lice.

EPIDEMIOLOGY

Source

Humans are the only hosts for these lice; they do not infest dogs, cats, or other animals or inanimate objects such as furniture, mattresses, bedding or carpets.

Occurrence

In the United States, infestation with head lice (*Pediculus humanus capitis*) is most common among preschool and elementary school-age children and their household members and caretakers. Head lice are not known to transmit disease; however, secondary bacterial infection of the skin resulting from scratching can occur with any lice infestation.

Getting head lice is not related to cleanliness of the person or his or her environment. Hair length, the frequency of shampooing or brushing does not influence the risk of a head lice infestation.

Head lice are mainly spread by direct contact with the hair of an infested person. The most common way to get head lice is by hair-to-hair contact with a person who already has head lice. Such contact can be common among children during play at school, home, and elsewhere (e.g. sports activities, playgrounds, camp, and slumber parties).

Uncommonly, transmission may occur by the following:

- Wearing clothing, such as hats, scarves, coats, sports uniforms, or hair ribbons worn by an infested person;
- Using infested combs, brushes or towels; or
- Lying on a bed, couch, pillow, carpet, or stuffed animal that has recently been in contact with an infested person.

Reliable data on how many people get head lice each year in the United States are not available; however, an estimated 6 million to 12 million infestations occur each year in the United States among children 3 to 11 years of age. Some studies suggest that girls get head lice more often than boys, probably due to more frequent hair-to-hair contact.

In the United States, infestation with head lice is much less common among African-Americans than among persons of other races. The head louse found most frequently in the United States may have claws that are better adapted for grasping the shape and width of some types of hair but not others.

Body lice are common among populations with poor hygiene and in colder climates where heavy clothing is worn, clothing is not changed regularly, and bathing is infrequent. Pubic lice are found worldwide and occur in all races, ethnic groups, and in all levels of society.

Mode of Transmission

Lice are a moderately contagious infestation of humans.

Direct: Person-to-person, direct hair-to-hair contact with hair of an infested person is responsible for most louse infestations. Lice cannot jump or fly; however, they can move quickly when warm and well fed.

Indirect: In addition to having a great deal of physical contact with others, school children tend to share lice carrying objects (fomites) more than other age groups. The risk of getting infested by a louse that has fallen into carpet or furniture is small. Head lice have no biologic urge to explore the fabric world and cannot survive off the host for longer than 24-48 hours (under ideal conditions of 72°F or higher and high humidity), as they require human blood to survive.

Lice will leave a host that has a fever. Combined with overcrowding, a fever may increase risk for transmission.

While uncommon, transmission from one head to another is possible via fomites soon after infestation of the object. The list of objects that can contribute to lice transfer includes the following:

- Brushes,
- Hats and scarves,
- Combs,
- Upholstered furniture,
- Pillows and cushions,
- Towels and bed linens,
- Clothing,
- Costumes and masks,
- Stuffed animals, dolls, cloth-covered toys, and
- Carpeting.

Although the degree to which fomites contribute to infestations is not clear, it is believed that they might become more important in transmission as the intensity of infestation in a community increases. Fomites might play a more important role in warmer climates or homes occupied by heavily infested people.

Both hair-to-hair and, less commonly, indirect transfer account for the high percentage of intra-familial infestations. The opportunities for physical contact; the sharing of towels, brushes, and clothing; and the use of the same furniture by all family members are responsible for the high incidence of transmission. Bed sharing and holding small children should also be considered high risk factors. If a family member has been identified with a lice infestation, the entire family should be examined for the presence of lice. **Only treat individuals that have been identified with an active lice infestation.**

Period of Communicability

Transmission is possible immediately after infestation through completion of the initial shampoo treatment or as long as live lice and nits remain viable on the infested person or fomites. The life cycle of an adult louse is approximately one month. Unhatched eggs will not survive or hatch below 72°F and are destroyed when removed manually. If a nit is not kept at the same temperature found close to the scalp, the nit will typically be unable to hatch and will usually die within a week. Away from the scalp, a louse will survive less than two days.

Incubation Period

The life cycle involves three stages: eggs, nymphs, and adults. Incubation of the egg takes 6-12 days. The most suitable temperature range for egg production and hatching is from 84.2°F

to 89.6°F. Sexual maturity is reached in 7-12 days. A mature female louse can lay 3-10 eggs (nits) per day, but they will only develop if the female has mated. The life span of an adult louse is about 30 days on the head of a host.

PUBLIC HEALTH MANAGEMENT

Case

Treatment

Treatment should be initiated as soon as nits and/or lice are found. Proper management involves not only treating the individual, but examining anyone to whom lice may have spread and treating those that are infested, and treating or initiating a two week isolation of all fomites with which the infested person had contact.

Step One: The first step is to **treat the infested individual** by applying a medication that will kill lice and nits. An effective pediculicide kills all lice and as many eggs as possible. It should also have residual action so that any nymphs that hatch after treatment will also die. Children ≤ 2 years old should never be treated with pediculicides; lice and nits should be removed by hand.

Treatment requires using an over-the-counter (OTC) or prescription medication. The following are treatment steps per the Centers for Disease Control and Prevention (CDC):

1. Before applying treatment, it may be helpful to remove clothing that can become wet or stained during treatment.
2. Apply lice medicine, also called pediculicide, according to the instructions contained in the box or printed on the label. If the infested person has very long hair (longer than shoulder length), it may be necessary to use a second bottle. Pay special attention to instructions on the label or in the box regarding how long the medication should be left on the hair and how it should be washed out.

WARNING:

Do not use conditioner or a combination shampoo/conditioner before using lice medicine. Do not re-wash the hair for 1-2 days after the lice medicine is removed.

3. Have the infested person put on clean clothing after treatment.
4. If a few live lice are still found 8-12 hours after treatment, but are moving more slowly than before, do not retreat. The medicine may take longer to kill all the lice. Comb dead and any remaining live lice out of the hair using a fine-toothed nit comb.
5. If, after 8-12 hours of treatment, no dead lice are found and lice seem as active as before, the medicine may not be working. Do not retreat until speaking with your healthcare provider; a different lice medicine (pediculicide) may be necessary. If your healthcare provider recommends a different pediculicide, carefully follow the treatment instructions contained in the box or printed on the label.
6. Nit (head lice egg) combs, often found in lice medicine packages, should be used to comb nits and lice from the hair shaft. Many flea combs made for cats and dogs are also effective.
7. After each treatment, checking the hair and combing with a nit comb to remove nits and lice every 2-3 days may decrease the chance of self-reinfestation. Continue to check hair for 2-3 weeks to be sure all lice and nits are gone.
8. Retreatment generally is recommended for most prescription and non-prescription (over-the-counter) drugs on day 9 in order to kill any surviving hatched lice before they

produce new eggs. However, if using the prescription drug malathion, which is ovicidal, retreatment is recommended after 7-9 days ONLY if crawling bugs are found.

The following medications are available for the treatment head lice:

Over-the-counter Medications

Many head lice medications are available "over-the-counter" without a prescription at a local drug store or pharmacy. Each over-the-counter product approved by the U.S. Food and Drug Administration (FDA) for the treatment of head lice contains one of the following active ingredients. If crawling lice are still seen after a full course of treatment, contact your healthcare provider.

1. Pyrethrins combined with piperonyl butoxide;
Brand name products: A-200*, Pronto*, R&C*, Rid*, Triple X*.

Pyrethrins are naturally occurring pyrethroid extracts from the chrysanthemum flower. Pyrethrins are safe and effective when used as directed. Pyrethrins can only kill live lice, not unhatched eggs (nits). A second treatment is recommended on day 9 to kill any newly hatched lice before they can produce new eggs. Pyrethrins generally should not be used by persons who are allergic to chrysanthemums or ragweed.

2. Permethrin lotion 1%;
Brand name product: Nix*.

Permethrin is a synthetic pyrethroid similar to naturally occurring pyrethrins. Permethrin lotion 1% is approved by the FDA for the treatment of head lice. Permethrin is safe and effective when used as directed. Permethrin kills live lice but not unhatched eggs. Permethrin may continue to kill newly hatched lice for several days after treatment. A second treatment often is necessary on day 9 to kill any newly hatched lice before they can produce new eggs. Permethrin is not approved for use on children less than 2 years old.

Prescription Medications

The following medications approved by the U.S. FDA for the treatment of head lice are available only by prescription. If crawling lice are still seen after a full course of treatment contact, your healthcare provider.

1. Malathion lotion 0.5%;
Brand name product: Ovide*

Malathion is an organophosphate. Malathion lotion 0.5% is approved by the FDA for the treatment of head lice. The formulation of malathion approved in the United States for the treatment of head lice is a lotion that is safe and effective when used as directed. Malathion is pediculicidal (kills live lice) and partially ovicidal (kills some lice eggs). A second treatment is recommended if live lice still are present 7-9 days after treatment. Malathion is intended for use on persons 6 years of age and older. Malathion can be irritating to the skin and scalp; contact with the eyes should be avoided. Malathion lotion is flammable; do not smoke or use electrical heat sources, including hair dryers, curlers, and curling or flat irons, when applying malathion lotion and while the hair is wet.

2. Benzyl alcohol lotion (5%);
Brand name product: Ulesfia lotion*

Benzyl alcohol is an aromatic alcohol. Benzyl alcohol lotion 5% is a white topical lotion approved by the FDA for the treatment of head lice; it is considered safe and effective

when used as directed. Benzyl alcohol kills live lice (it is pediculicidal) but does not kill unhatched lice eggs (it is not ovicidal). A second treatment with benzyl alcohol lotion is necessary on day 9 after the first treatment (or as recommended by the manufacturer) to kill any newly hatched lice before they can produce new eggs. Benzyl alcohol lotion is intended for use on persons who are 6 months of age and older. Benzyl alcohol can be irritating to the skin and eyes; contact with the eyes should be avoided.

3. Lindane shampoo 1%;
Brand name products: None available

Lindane is an organochloride. The American Academy of Pediatrics (AAP) no longer recommends it as a pediculocide. Although lindane shampoo 1% is approved by the FDA for the treatment of head lice, it is not recommended as a first-line therapy. Overuse, misuse, or accidentally swallowing lindane can be toxic to the brain and other parts of the nervous system; its use should be restricted to patients for whom prior treatments have failed or who cannot tolerate other medications that pose less risk. Lindane should not be used to treat premature infants, persons with HIV, a seizure disorder, women who are pregnant or breast-feeding, persons who have very irritated skin or sores where the lindane will be applied, infants, children, the elderly, and persons who weigh less than 110 pounds.

When treating head lice:

1. Do not use extra amounts of any lice medication unless instructed to do so by your physician and pharmacist. The drugs used to treat lice are insecticides and can be dangerous if they are misused or overused.
2. Do not treat an infested person more than 2-3 times with the same medication if it does not seem to be working. This may be caused by using the medicine incorrectly or by resistance to the medicine. Always seek the advice of your healthcare provider if this should happen. He/she may recommend an alternative medication.
3. Do not use different head lice drugs at the same time unless instructed to do so by your physician and pharmacist.

Follow-up care includes checking for nits and lice for 14 days post-retreatment. There may be no problem readmitting children to school following the first treatment for head lice, even if nits remain. Both the American Association of Pediatrics and the National Association of School Nurses advocate that "no-nit" policies be discontinued. CDC indicates that "no-nit" policies that require a child to be free of nits before they can return to schools should be discontinued for the following reasons:

- Many nits are more than ¼ inch from the scalp. Such nits are usually not viable and very unlikely to hatch to become crawling lice, or may in fact be empty shells, also known as casings.
- Nits are cemented to hair shafts and are very unlikely to be transferred successfully to other people.
- The burden of unnecessary absenteeism to the students, families and communities far outweighs the risks associated with head lice.
- Misdiagnosis of nits is very common during nit checks conducted by nonmedical personnel.

A nit-free policy can be a good tool for surveillance and assurance of compliance. However, if adopted, it should be flexible and selective, taking into consideration the following:

- Reliability of the parents or guardians in administering the treatment correctly.
- The pediculicide used. (See details above.)

- Size and duration of the outbreak, including whether it is a repeat of a previous one or if it is a persistent one.
- Whether the case is a re-infestation of a previously treated individual.

Since it is difficult to enforce or comply with a nit-free policy, the following might be considered:

- An extended compliance period (3-7 days).
- Enforcement only for repeat cases.
- Enforcement only for those with nits present at the 14-day post-treatment examination.

A nit-free policy should not result in children losing time from school. In cases where children are experiencing persistent or repeated infestations, careful attention should be given to **Step 2** that follows. Special attention may have to be given to a select few individuals by applying medication (with the parents' permission) at school, supervision of treatment in the home, or eliciting the help of other agencies. Responsibility for the control of head lice falls on parents or guardians, not the school. Children can become infested at school, but the lice come from other children, not the school itself.

Step Two: The second step is to **examine all contacts** to which lice might have spread and treat those that are infested. All household members should be examined: adults as well as children. In addition, anyone with whom the infested person had recent physical contact or possibly shared lice-carrying fomites (e.g. classmates, playmates, babysitters in the case of infested children, and co-workers and acquaintances in the case of adults) should be notified and examined. If they are found to have lice or nits, their families and other contacts should be notified, and so on. It is only by attempting to eliminate the entire chain of transmission that the cycle of infestation and reinfestation can be broken.

Step Three: The third step is **environmental control** by thoroughly cleaning bedding and all objects contacted by the infested individual in the 48-hour period before the initial treatment. Effective disinfection can be achieved by vacuuming, machine washing, machine drying, dry cleaning, ironing, freezing, or storing fomites in tightly sealed plastic bags for two weeks. The following recommendations are based on the fact that temperatures of 130° F or higher are lethal to lice and nits:

- Floors, rugs, pillows, and upholstered furniture should be thoroughly vacuumed.
- All clothing, linen, and cloth toys that the infested person might have worn or handled in the 48 hours before diagnosis should be machine washed in hot water (130°F) or placed in a freezer overnight.
- Items that cannot be machine washed but can be machine dried should be dried at the hottest setting for at least 20 minutes.
- Other items may be dry-cleaned, carefully vacuumed, placed in a freezer overnight, or sealed in plastic bags for two weeks.
- Combs and brushes should be soaked in hot water (130°F) for one hour.

Spraying classrooms or homes with insecticides is not recommended for cases of head louse infestation. Fumigant sprays can be toxic if inhaled or absorbed through the skin.

Isolation

Ohio Administrative Code (OAC) 3701-3-13 (Q) states:

"Pediculosis: a person with body lice shall be excluded from school or child care center until twenty-four hours after application of an effective pediculicide. A person with head lice shall be excluded from school or child care center until after the first treatment with an

appropriate pediculicide."

Prevention and Control

The real key to controlling pediculosis is prevention (i.e. containing the problem before it can spread). Prevention involves education to avoid habits that spread lice, education of parents of school-aged children to check regularly for lice or nits, education of school personnel to check students for lice and nits and to minimize opportunities for sharing of fomites and education of the community in general about the control of pediculosis.

In the United States, the majority of school outbreaks of pediculosis occur in fall and winter. This probably results from the increase in head louse populations during the ideal conditions of summer warmth and humidity. September has been declared "Pediculosis Prevention Month." It is suggested that one of three annual school-wide screenings for pediculosis be held in the first week children return to school after summer vacation. The other two screenings, in the week following Christmas vacation and in the last week of school, should be supplemented by regular spot checks throughout the year.

The school environment should be checked for potential means of louse transmission and changes recommended if necessary. Children should be taught not to exchange combs, brushes, clothing or blankets and pillows. School property such as gym towels, athletic equipment and costumes should not be passed from child-to-child unless they are properly cleaned. At the beginning of each school year, written information about head lice prevention can be sent to parents, describing what the school is doing to prevent infestation and suggesting what parents can do at home. School officials can also arrange for a presentation by local health professionals at a parent-teacher association meeting.

If such preventive guidelines are followed at summer programs such as sleep-away camps and daytime programs, children will be more likely to enjoy a louse-free summer, and there will be less risk of infestation when they return to school in the fall.

A successful pediculosis prevention program requires cooperation among school staff, public officials, and health professionals to make information available to the public. Policy decisions regarding head lice control are ultimately up to the facilities and institutions to establish. Involvement of the local health department is strongly encouraged to develop an effective control program for successful prevention of protracted outbreaks.

SPECIAL INFORMATION

Written material and videotapes are available from the Ohio Department of Health (ODH). The videos available are: *Advice on Lice* and *Facts of Lice*. The videos may be reserved by calling the ODH Health Promotion Library at 614-466-4626. Information and help may be obtained by contacting the ODH Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599.

SAMPLE LETTERS

[For Students with head lice]

Dear Parent:

Your child was examined today and found to have head lice. This is an easily treated condition that is not associated with any serious medical complications. This letter will acquaint you with the nature of this infestation and what you can do to help get rid of it.

In the United States, head lice infestation is most common in children attending child care and elementary school. Head lice is not a sign of poor hygiene, and all socioeconomic groups are affected. Head lice infestation is not influenced by hair length or frequency of shampooing, hair brushing or frequency of bathing. Head lice are not a health hazard, because they are not responsible for spreading disease. Transmission occurs mainly by direct head-to-head contact with hair of infested people. Transmission by contact with personal belongings, such as combs, hair brushes and hats, is uncommon. Away from the scalp, head lice survive less than 2 days at room temperature, and their eggs generally become nonviable within a week and cannot hatch at a lower temperature than that near the scalp.

Head lice are small, elongated insects about this (--) long (maximum) and are yellowish white to greyish white with dark margins. **LICE DO NOT JUMP OR FLY, NOR DO THEY STAY ALIVE FOR LONG PERIODS OFF THE HUMAN HEAD.** They can move very quickly once on the head and are difficult to find.

Because head lice are good at hiding in the hair, an infestation is usually diagnosed by finding the nits (louse eggs). Nits are teardrop-shaped, about the size of a typewritten comma, and vary in color from yellowish-brown to white. Head lice attach each nit to a hair shaft at the scalp with a waterproof, cement-like substance. Thus, nits cannot be washed or brushed out of the hair like dandruff or other debris resembling nits. Nits are most commonly found on hairs at the nape of the neck and behind the ears, where they are protected from extreme light and temperatures. However, clusters of nits can be found in any area of the hair, requiring examination of the entire head.

It is necessary to inspect and treat the infested individual and his/her contacts, including family members who are also infested. Personal articles that any infested person has worn or used within the previous 48 hours should be disinfested. The following treatment procedures should be carried out before your child returns to school:

- 1) Obtain head louse shampoo from your pharmacy, physician or local health department. Several medications are available without a prescription: A-200 Pyrinate, RID, NIX, etc. Other medications are available with a physician's prescription.
- 2) Apply the shampoo according the manufacturer's directions: **DO NOT OVER TREAT!!** Do not allow children to apply the shampoo to themselves. Be sure that the product gets to the scalp and remains there the recommended length of time.
- 3) Have your child put on clean clothing after treatment.
- 4) Manually remove all nits from your child's hair. Do not rely solely on the nit combs supplied with the products. Using finger tips and fingernails is the most efficient method of nit removal. Nits may be disposed of by dipping the fingers with the nits into a small

jar of rubbing alcohol or warm soapy water. Adequate lighting is essential to aid in detecting nits for removal. Nit removal is time consuming but is extremely important for elimination of the infestation. Your child may not be allowed to attend school until he/she is nit free. Wash your hands thoroughly after completing nit removal.

5) Repeat treatment with the shampoo after 7-10 days as directed by the manufacturer.

Since heat kills lice and their eggs, many personal articles can be disinfested by machine-washing in **HOT** water and/or drying on the **HOT** cycle for at least 20 minutes. Both nits and adults are killed in 10-20 minutes at 130°F. Home hot water heaters keep water at or above this temperature when the heat selector is set on medium or higher.

Carpets, furniture, etc., do not require special treatment, as lice live only about 24 hours off the head. Normal vacuuming is sufficient treatment of these items. **APPLICATION OF PESTICIDES OR FUMIGATION IS NOT NECESSARY!** Animals other than humans do not carry these lice; there is no need to treat family pets.

Babysitters and parents of your child's closest friends must be notified that they and their children might also be infested. This is particularly important if the children have slept together or participated in activities involving direct hair-to-hair contact, such as athletics, dance classes, etc. If the friend becomes infested while playing with your child and is not treated, your child might become reinfested from the friend. This also applies to all family members. **TREATMENT DOES NOT PREVENT REINFESTATION.**

Your child may return to school the day following treatment. The school nurse or trained school employee may examine your child's hair and scalp at that time. If the school has a nit-free policy and nits are found, you may be asked to pick your child up from school.

Thank you in this matter.

[For Contacts of children with head lice]

Dear Parent:

A case of head lice has been identified in your child's classroom. Please do your part to prevent the spread of this condition. Check your child(ren) daily for the next few weeks, and on a regular basis thereafter. If you should find head lice or their nits on your child(ren), or have questions or need assistance, please contact the school nurse at _____.

[Note: You may wish to include paragraphs 2, 3 and 4 of the preceding letter.]

Thank you for your cooperation.

What is Pediculosis?

Pediculosis is an infestation of the body with human lice - adults, nymphs and/or nits (eggs). The crawling stages of lice feed on human blood, causing severe itching.

There are three types of human lice, each of which requires a different environment to survive. Only specific portions of the human body can be infested by each type of louse.

- **Head lice** live in the hair of the head and feed on the scalp.
- **Body lice** do not live on the human host but in the seams of infrequently changed and washed clothing, getting onto the skin only long enough to feed.
- **Pubic or crab lice** are usually found on the pubic hairs, but can also occur on facial hair (including eye lashes and eye brows), chests, armpits and abdomens.

Who gets pediculosis?

Anyone, regardless of age, race, sex, or standards of personal hygiene, can become infested through contact with an infested person. Head louse infestations are common in schools and child care settings, while pubic lice are more common among the sexually active population. Body lice are prevalent in populations with very poor hygiene habits.

How is pediculosis transmitted?

Head lice are most commonly transferred from the hair of an infested person to that of another by direct hair-to-hair contact. Transmission by contact with personal belongings, such as combs, hair brushes, and hats, is uncommon. *Lice do not jump or fly!*

Body lice are transmitted from person to person on shared clothing and/or bedding.

Pubic lice are most commonly transmitted by direct skin-to-skin contact, usually during sexual contact. Other routes are possible, but less likely.

Head, body, and pubic lice infest only humans; they do not come from other animals and cannot be contracted from dogs, cats, birds, etc. Animal lice can crawl onto humans and feed, but they cannot reproduce and will eventually die.

What are the symptoms of pediculosis?

Itching of the infested area is the most common symptom of a louse infestation. Frequent scratching occurs as a result, often breaking the skin and leading to secondary bacterial infections. A tickling sensation in the hair or sensation of something moving, irritability or sleeplessness, and sores on the head caused by scratching are other potential symptoms of head lice. The back of the head and behind the ears are the places most favored by head lice, both for feeding and laying their eggs, however lice and nits can be found anywhere on the head.

Genital itching, accompanied by slate-blue marks where the lice have fed, is characteristic of pubic lice.

Body lice tend to get onto the skin in areas clothing fits snugly, hence the belt line and collar and cuff areas are the usual sites for their feeding activities.

How soon do symptoms occur?

Itching begins a few days to several weeks after infestation. Head lice infestations can be

asymptomatic, particularly with a first infestation or when an infestation is light.

For how long can a person spread pediculosis?

As long as live lice are present and until all lice and eggs are killed and removed, pediculosis can be spread from one person to another.

What is the treatment for pediculosis?

Treatment for head lice is recommended for persons diagnosed with an active infestation. All household members and other close contacts should be checked; those persons with evidence of an active infestation should be treated. Some experts believe prophylactic treatment is prudent for persons who share the same bed with actively-infested individuals. All infested persons (household members and close contacts) and their bedmates should be treated at the same time.

Retreatment of head lice usually is recommended because no approved pediculicide is completely ovicidal. To be most effective, retreatment should occur after all eggs have hatched but before new eggs are produced. The retreatment schedule can vary depending on whether the pediculicide used is ovicidal (whether it can kill lice eggs).

When treating head lice, supplemental measures can be combined with recommended medicine (pharmacologic treatment); however, such additional (non-pharmacologic) measures generally are not required to eliminate a head lice infestation. For example, hats, scarves, pillow cases, bedding, clothing, and towels worn or used by the infested person in the 2-day period just before treatment is started can be machine washed and dried using the hot water and hot air cycles because lice and eggs are killed by exposure for 5 minutes to temperatures greater than 53.5°C (128.3°F).

It is not necessary or recommended to spray, fumigate, or otherwise chemically treat the home, school or child care center for lice.

What can be done to prevent the spread of pediculosis?

Head Lice: Household and other close contacts should be examined and treated if infested. Bedmates of infested people should be treated prophylactically at the same time as the infested household member and contacts. Prophylactic treatment of other non-infested people is not recommended. Children should not be sent home early from school because of head lice. Parents of infested children (i.e. with at least one crawling louse) should be notified and informed that their child may return to school 24 hours after treatment with an effective pediculicide. **This should not result in prolonged absenteeism. Treatment can be accomplished overnight, allowing readmission the following day.** "No-nit" policies requiring that children be free of nits before they return to a child care facility or school have not been effective in controlling head lice transmission and are not recommended.

Body Lice: The most important factor in the control of body lice infestation is the ability to bathe, and change and wash clothing. Close contacts should be examined and treated appropriately; clothing and bedding should be laundered. Care should be taken to avoid extensive contact with infested clothing and bedding in the process of accomplishing this task.

For more information, contact your local health department or the Ohio Department of Health (ODH) Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599.